FACING UP TO FUTURE WATER PROBLEMS

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This topic poses an interesting proposition and projects a highly significant point. The title is well chosen -- it doesn't say we have problems -- but it does say we are going to have problems. Facing up to them implies that there is some degree of control of future plans, and, of actions, or implementation that may prevent problems; or, at the least, provide an opportunity to modify their seriousness.

Let's look at some of the basics with respect to water and some of the problem potentials.

Less than one (1) percent of the world's water is "fresh". The remainder is tied up in polar ice caps and in the world's oceans and seas. The amount of fresh water is a rather constant, fixed value and does not vary greatly from year to year on a world wide basis. Fresh water is found in aquifers - underground sources and in lakes and streams.

The hydrologic cycle is nature's solar fired re-charging re-cycling system. It delivers an average of 30" of water annually on the continuous 48 states. This equates to 4.2 trillion gallons/day. It operates on a continuous fixed basis from a "recharge" standpoint, however, the discharge side of the cycle - man's use of fresh water - is variable and when use exceeds supply - there are problems. This is happening in many locations and well may happen in many others. Man complicates the water picture through pollution and depletion of fixed water supplies -- acquifers like the great Ogaglla which, because of its structure and the texture of the soils overlaying it, can be recharged only very slowly, under natural conditions. The picture is further complicated by the increasing use man is making of water - an estimated one-third (33 percent) increase over 1978 consumption, by 2000. Agriculture uses 80+ percent of our fresh water and needs more, so does industry as does our ever increasing population. Thus we are faced with increasing use of a fixed water supply. Which, in time, means an overdraft - a dry well - a problem.

One other factor that is key to the water situation - location. Where the water is located. Russia and Canada have 20 percent each of the world's fresh water; the United States three (3) percent. Of that 3 percent in the U.S., location or position is well known - we speak of the humid east and the semi-arid and arid west. Yet, within the area delineated by a line between sub-humid and semi-arid which roughly parallels the Pedocal-pedalfer line there are areas of excess and deficiency. Rivers move large volumes of water across the continent and, the Great Lakes hold tremendous quantities of fresh water, but all is of little value to Arizona or Southern California - at this time. Then there is the Colorado River water problem (not anywhere near enough water to supply those with a legal right to water from the river and the problems between southern California (have not) and northern California (have).

The conflicts between the "haves" and "have nots", have and will continue to intensify. It's been said that in the West, future problems over allocation of water will make the range wars of old pale to insignificance. There are schemes to divert Missouri River to recharge the upper end of the Ogallala(South Dakota - Nebraska) and to direct Red River water to recharge

the lower reaches (Texas). Why? Why are such schemes ever discussed? One example, twenty-five to thirty years ago, 2,500-3,000 irrigation wells were located in the panhandle area of Texas. Today 70,000-80,0000. Why does this concern you? Because we, as taxpayers, will provide the funds. Then there are the conflicts that arise between adjacent states. For example, coal companies need Missouri River Water for coal slurry operations in Wyoming to move this basic resource to the east. Such matters may become intensely political.

A recent gubernatorial campaign in Wyoming between the then incumbent Ed Herschler and Warren Morton Challenger received widespread media coverage because Herschler "gave away" some of Wyoming's underground water to South Dakota "for free". South Dakota, in turn sold it to Energy Transportation Systems, Inc. for use in a coal slurry pipeline for 1.4 billion dollars. Such matters fuel the fires of political campaigns and are the embryonic genesis of future problems that we as a nation much face up to.

In the August 16, 1982 issue of Forbes magazine Fact and Comment edited by Maloclm S. Forbes, he stated, "Not in the lifetime of some of us, but Canada's most vital export to the U.S. will one day be water - not oil, not natural gas, not minerals and metals, not newsprint." Further, he points out that a major oilman told him as early as 1976 (Forbes, Aug. 20, 1979), "In the future, both the U.S. and Mexico will be dependent on Canada for two-thirds of their water supply. He concluded by saying, "In the lifetime of younger readers, our present pipelines, and future ones, will be carrying more water than oil and natural gas". Thus, the problem of location of fresh waters is being addressed. And, tranpsort of water from a "have" region to a "have not" is a major problem that we face.

In other situations, we may have adequate water, but it may become unuseable. A case in point, salt water intrusion which is occurring in Florida, Texas and elsewhere. At least one city Sebastian, Florida has been denied permission to drill new wells for this reason.

Then there is the case of the collapse or loss of, particularly limestone, aquifers. They become sink holes in Florida, when they collapse they sometimes gobble up large sections of towns.

Long range research programs to direct actions and to affect solutions are being initiated. For example: Fountainhead. The Freshwater Foundation, Navarre, Minnesota (which some of you visited with Walter Wilkie a few years ago) recently announced a program called Fountainhead, a vital five year plan "to intercept the growing international water crisis". It is a 7 million dollar fund raising program to build up the expertise of the Freshwater Foundation and the Gray Freshwater Biological Institute. The program will attack major freshwater problems by updating and expanding the research, facilities, and programs initiated during the past 14 years. This unique organization is and has been "facing up to future water problems". And, so are other organizations - for example, the USGA and GCSAA. They are developing programs and soliciting funds to produce drought tolerant, salt tolerant grasses that will require less water and less maintenance.

Water conservation and use of waste waters remain keys to current and future water management on turfgrass facilities. In fact, they are essential if current levels of turf quality are to be maintained in the foreseeable future and if we are to avoid serious future problems.

There are other areas of activity that require your immediate attention as turf grass manager. Now - today there is a need for each turf facility irrespective of location to take stock of their indiviudal water needs. The need to meet with the local water management authority and make their needs

known! They need to establish a base position so that when the time comes for allocation, the facility will be in line for their fair share. Not simply to be told to stop watering! An example of this approach was that taken a few years ago by members of the South Florida Turfgrass Industry. They met with the South Florida Water Management District and presented a summary of their needs. They described the average acreage (125) for the 350 golf courses within the district. Pointed out this "constitutes an urban life support factor by providing oxygen for 2,920,000 people each year," and that a conservative estimate of the combined economic value of their golf courses is 350 million dollars annually. They, then, presented a detailed water requirement schedule by defining the basic areas and establishing priorities and quantitative values for each.

As a result, during a critical period they were able to continue to irrigate their golf courses. Not so in New Jersey; where, during a severe drought, golf course watering was curtailed. The clubs then had to initiate programs to effect legislation to permit watering of, at least, greens. Rains came a short while later and avoided disaster, but the potential existed. And how many of us have to water on alternate days; or, are told not to water lawns - during critical summer stress periods. In many cases this is a distribuiton problem but it curtails our use of water. There are seven simple, basic steps that I believe will lead to water conservation. They are the key to future water use needs and certainly will help us face up to future water problems.

1. Establishing watering priorities. Give highest priority to the most intensively managed area; for example, the greens, the most valuable part of the course and where the most critical play takes place.

2. Follow sound irrigation practices. Irrigate when there is the best combination of little wind, low temperature and high humidity. When watering trees and shrubs, use probes so the water will penetrate deeply. Install automatic irrigation systems, learn to use the controllers; and, consider drip irrigation where it is applicable.

3. Reduce, or avoid where possible, other causes of stress. Make certain there is adequate internal soil drainage to ensure maximum root growth -- more importantly, to avoid root zone saturation.

4. Alter major cultural practices. Test the soil annually to ensure adequate fertility, especially for phosphorus, which encourages root system growth -- deeper roots, thus expanding the area from which the turfgrasses can draw nutrients and moisture.

   Raise the height of cut for all areas. Raising the height of cut on a golf course green as little as 1/32 of an inch can have a significant effect on the ability of the grass to tolerate stress.

   Increase frequency of spiking or cultivating (core) -- if temperatures are not extreme -- to trap moisture and to hold it longer in the vicinity of the root system.

5. Expand use of mulch. This is often overlooked. Apply heavy layers of mulch -- any organic debris that's available -- around the base of trees, shrubs and flower beds, to hold in moisture and to help control weeds.

6. Erect wind barriers, especially where there are large expanses of open spaces.

7. Experiment with anti-transpirants. Although techniques for inhibiting transpiration have had mixed results, some reduction in moisture loss through transpiration might be accomplished with use of chemicals, emulsions or films.

8. In short, practice good water management every day. Treat every day as if it is just another of a severe drought period.

In summary, we have water problems today and they well may intensify. They are not going to go away. We must plan now to ensure a fair allocation of water for the vital green spaces for which we have responsibility. We must become an integral and active part of all conservation programs and all waste water utilization programs that conserve and use our water wisely.